



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|----------------------------|------------------------|
| 10/502,304 | 07/21/2004 | Goro Kawasaki | 1109.70960 | 1605 |
| 24978 | 7590 | 04/30/2007 | | |
| GREER, BURNS & CRAIN 300 S WACKER DR 25TH FLOOR CHICAGO, IL 60606 | | | EXAMINER GOMA, TAWFIK A | |
| | | | ART UNIT 2627 | PAPER NUMBER |
| | | | MAIL DATE 04/30/2007 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/502,304

Applicant(s)

KAWASAKI ET AL.

Examiner

Tawfik Goma

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Deckert (US 4420780).

Regarding claim 1, Deckert discloses a floating slider including an opposing face opposed to a storage medium (fig. 2), the opposing face having a crown surface like an outer columnar surface having an axis extending radially of the storage medium (fig. 2), the floating slider being floated off the storage medium by air flowing in between the storage medium and the opposing surface (col. 2 lines 22-29), wherein the following expression is satisfied where d represents a crown thickness defined as a distance from an vertex of an arc in a section of the crown surface to a chord of the arc, and L represents a slider length defined as a length of the opposing face parallel to the chord: $250 \text{ (nm/mm)} \times L \text{ (mm)} \leq d \text{ (nm)} \leq 250 \text{ (nm/mm)} \times L \text{ (mm)} + 1500 \text{ (mm)}$ (col. 2 lines 15-21).

Regarding claim 5, Deckert further discloses wherein the slider length is 2 mm through 6 mm, a slider width defined as a distance of the opposing face radially of the storage medium is

Art Unit: 2627

1.2 mm through 5.0 mm, and the crown thickness d is 500 nm through 3000 nm (col. 2 lines 15-21).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deckert (US 4420780) in view of Akagi et al (US 5253232).

Regarding claim 2, Deckert fails to disclose wherein the opposing face has an air entering end formed with a tapered flat surface having a length of 0.3 mm through 0.5 mm toward the chord and crossing the chord at an angle of 0.5 degrees through 1.0 degree. In the same field of endeavor, Akagi discloses tapering a crown that is on a slider such that a taper length is .4 mm (fig. 9) and the angle is selected between .5 degrees and 1 degree as the optimal angle (fig. 9). It would have been obvious to one of ordinary skill in the art to provide the taper with the length and the angle disclosed. The rationale is as follows: One of ordinary skill in the art at the time of the applicant's invention would have been motivated to provide a taper for the slider in order to improve the dynamic floating stability of the flying head (see Akagi, col. 7 lines 41-53)

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deckert (US 4420780) in view of Barrois et al (US 5748408)

Regarding claim 3, Deckert fails to disclose wherein the opposing face has an air entering end formed with a recessed step having a depth of 1 um through 5 um. In the same field of

Art Unit: 2627

endeavor, Barrios discloses providing a step within the range of 1 μm and 5 μm (col. 4 lines 56-61). It would have been obvious to one of ordinary skill in the art to modify the slider disclosed by Deckert by providing the step disclosed by Barrios. The rationale is as follows: One of ordinary skill in the art at the time of the applicant's invention would have been motivated to provide the step in order to limit the flight height with increased speed (see Barrios col. 3 lines 20-25).

Regarding claim 4, Deckert fails to disclose wherein the floating slider is a monorail slider in which the entire crown surface is formed as a single surface. Barrios discloses wherein the slider can be alternatively formed as a monorail slider (col. 1 lines 20-23). It would have been obvious to one of ordinary skill in the art to modify the slider disclosed by Deckert by providing a monorail slider. The rationale is as follows: One of ordinary skill in the art at the time of the applicant's invention would have been motivated to provide a monorail structure in order to simplify the slider configuration.

Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable Deckert (US 4420780).

Regarding claim 6, Deckert discloses a slider with a length of 4 mm, width of 3 mm and crown thickness of 1 μm , but fails to disclose wherein the slider length is approximately 6 mm, the slider width defined as a distance of the opposing face radially of the storage medium is approximately 4 mm, and the crown thickness d is 1500 nm through 3000 nm. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the length of 4 mm, width of 3 mm and crown thickness of 1500 nm. The motivation would have been: to adjust the dimensions of slider in the course of routine engineering

Art Unit: 2627

optimization/experimentation. Moreover, absent a showing of criticality, i.e., unobvious or unexpected results, the relationships set forth in claim 6 are considered to be within the level of ordinary skill in the art. Additionally, the law is replete with cases in which the mere difference between the claimed invention and the prior art is some range, variable or other dimensional limitation within the claims, patentability cannot be found. It furthermore has been held in such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range(s); see *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). Moreover, the instant disclosure does not set forth evidence ascribing unexpected results due to the claimed dimensions; see *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338 (Fed. Cir. 1984), which held that the dimensional limitations failed to point out a feature which performed and operated any differently from the prior art. The disclosure shows that the advantages are contained for dimensions within a range as depicted in figure 6, and Deckert's disclosure shows dimensions within that range.

Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe US 2001/0008502) in view of Deckert (US 4420780).

Regarding claim 7, Watanabe discloses a magneto-optical storage device including a light condenser for formation of a laser spot on a storage medium (SIL, fig. 3) and a magnetic field generator for generation of a magnetic field at a region where the laser spot is formed (Magnetic field mod. coil, fig. 3) wherein the light condenser and the magnetic field generator are mounted on a floating slider. Watanabe fails to disclose wherein the slider is the slider according to claim 1. Deckert discloses providing the slider according to claim 1 as previously discussed. It would

Art Unit: 2627

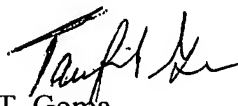
have been obvious to one of ordinary skill in the art at the time of the applicant's invention to provide the slider of Deckert. The rationale is as follows: One of ordinary skill in the art would have been motivated to provide the slider of Deckert in order to improve the stability of the slider using the shape of the crown.

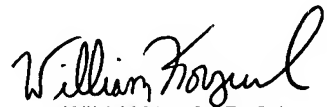
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tawfik Goma whose telephone number is (571) 272-4206. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


T. Goma
4/26/2007


WILLIAM KORZUCH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600